APPEAL 2617

PTO/SB/21 (01-08)
Approved for use through 06/30/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	10/064,286
Filing Date	June 28, 2002
First Named Inventor	HELLAKER, Jan
Art Unit	2617
Examiner Name	D'AGOSTA, Stephen M.
Attorney Docket Number	7589.033.PCUS00

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☑ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

Certified Priority Application SE 9904845-6
filed with the USPTO via US Mail on June 10, 2008

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	NOVAK DRUCE + QUIGG LLP		
Signature	/Tracy W. Druce/		
Printed name	Tracy W. Druce		
Date	June 10, 2008	Reg. No.	35,493

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	Rose Marie Henderson		
Typed or printed name	Rose Marie Henderson	Date	June 10, 2008

PRV

PATENT- OCH REGISTRERINGSVERKET

Patentavdelningen

Intyg
Certificate

Härmed intygas att bifogade kopior överensstämmer med de handlingar som ursprungligen ingivits till Patent- och registreringsverket i nedannämnda ansökan.

This is to certify that the annexed is a true copy of the documents as originally filed with the Patent- and Registration Office in connection with the following patent application.

(71) *Sökande* / *Applicant (s)* — *Volvo Technology Corp, Göteborg SE*

(21) *Patentansökningsnummer* / *Patent application number* — *9904845-6*

(86) *Ingivningsdatum* / *Date of filing* — *1999-12-29*

Stockholm, 2008-05-27

För Patent- och registreringsverket
For the Patent- and Registration Office

William Ddumba

Avgift
Fee 170:-

PATENT- OCH REGISTRERINGSVERKET
SWEDEN

Postadress/Adress
Box 5055
S-102 42 STOCKHOLM

Telefon/Phone
+46 8 782 25 00
Vx 08-782 25 00

Telex
17978
PATOREG S

Telefax
+46 8 666 02 86
08-666 02 86

SYSTEM AND METHOD FOR COMMUNICATION BETWEEN A CENTRAL STATION AND REMOTE OBJECTS

The invention relates to a system for communication between at least one central station and at least one remote mobile or stationary object by means of transmitting and receiving means.

This system and method is especially suitable and provided for exchange of information, data and even software programs, as well as for voice communication between cars, trucks, boats or other vehicles on one hand and at least one central station on the other hand, which is for example a center or service station of a manufacturer, a headstation for guiding or operating the vehicles or for providing help in case of emergency and accident, respectively. Further, the system and method is suitable and provided for communication with facilities and plants in remote areas which are operated, controlled, observed or monitored from one or more of those central stations.

US 5 890 061 (EP 0 789 498) discloses a vehicular emergency message system for a mobile vehicle for communication with a response center. A cellular transceiver, such as a cellular telephone, has a restricted and an unrestricted operating mode. The restricted operating mode is selectable by a user to affect communication links that are permitted during normal operation, whereas the unrestricted operation mode is activated prior to initiating a request for assistance in case of emergency, thereby allowing a more reliable connection over a cellular telephone network.

Further vehicular emergency message systems for mobile vehicles are disclosed in US 5 781 101, US 5 687 215, US 5 686 910 and US 5 572 204, respectively. A user can request emergency or roadside assistance from a response center by activating a button in the vehicle. The global positioning system is used to continuously store the vehicle

location. A cellular telephone network is used to contact a response center and transfer a data string via modem containing information to assist the response center in acting on the request. The various systems comprise additional means either for storing system information, for sending a termination tone to the vehicle upon satisfactory completion of the request, for initiating an automatic call-in to the response center if a predetermined time has elapsed since the last connection and for initiating a second call to a different telephone number if a first attempt to contact the response center has been unsuccessful, respectively.

It is an object of the invention to provide a system and method for communication between at least one remote object and at least one central station by means of transmitting and receiving means by which the reliability of communication is improved.

It is a further object of the invention to provide such a system and method for communication between at least one remote object and at least one central station by which detection of emergency situations is improved.

It is a further object of the invention to provide such a system and method for communication between at least one remote object and at least one central station which is able to initiate a remote diagnostic of the at least one object.

These and other objects are achieved by a system for communication between at least one central station and at least one remote mobile or stationary object by means of transmitting and receiving means, which is characterized in that said at least one object comprises a cellular phone module which provides a private subscription for private usage by a driver or operator of the object, and a selectable service subscription for transmitting and managing of at least one service like remote status information, malfunction, diagnostics and maintenance as well as technical and emergency assistance by means of the at least one central station.

These and other objects are further achieved by a method according to claim 8.

The subclaims comprise advantageous embodiments of the solutions according to claim 1 and 8, respectively.

Further details, features and advantages become apparent from the following description of a preferred embodiment of the invention with reference to the drawings, in which:

Fig. 1 is a general view of various components of an inventive system;
Fig. 2 is a first unit as incorporated in a mobile object;
Fig. 3 is a second unit as incorporated in a stationary object;
Fig. 4 is a flow chart indicating various steps in different operating modes; and
Fig. 5 is a flow chart indicating various steps in further operating modes.

The major components of a preferred embodiment of the inventive system and its environment are shown in Fig. 1. It comprises a customer service center 10 with an operator 11. At least one vehicle 20, at least one boat or ship 24, as well as one or more stationary equipments 25 like a remote facility or plant communicate with the service center 10 via a cellular communication network 30 like GSM (european standard) or AMPS (US standard) and/or a satellite communication network 31, both for exchanging of information, data and voice communication, each in both directions. Further, even software programs can be transmitted if necessary. A position of the vehicles is detected by means of the global positioning system (GPS) 40. Emergency assistance vehicles 21, 22 and a roadside assistance vehicle 23 communicate with the service center 10 in a similar manner or in any other way and are activated by the service center in case of need by one of the objects 20, 24, 25.

The system provides in general telephone services and emergency and technical assistance using both cellular and satellite communication 30, 31. This allows for a

reliable connection between the said objects 20, 24, 25 and the customer service center 10 (or another response center).

More specifically, the customer service center 10 can handle automatically emergency situations, remote diagnostics, maintenance and command to said mobile and stationary objects 20, 24, 25. Further, a vehicle driver or operator of the remote facility can manually request help or signal emergency to the customer service center and additionally, the mobile and stationary objects can inform automatically the customer service center in case of emergency, malfunction or for other reasons. All these exchange of data, voice and information (and even software programs if necessary) is conducted with a high reliability due to the use of both cellular 30 and satellite communication 31. The actual position of an object is evaluated by the global positioning system 40.

Fig. 2 shows a block diagram of a first unit of the system as incorporated in a mobile object like said vehicle or ship. It comprises a controller module 200 for bidirectional communication with a data bus or network manager 201, a cellular phone module 202, a satellite communication module 203, a GPS controller 204 and a user interface manager 205 which is connected to a keypad 206 with incorporated loudspeaker and microphone for voice communication. Further, a backup battery (not illustrated) is provided for supplying these modules in case of main battery failure.

For transmitting and receiving signals, the phone module 202 is connected with a first antenna 210. A backup mobile phone antenna (not illustrated) is included in the phone module for usage in case of damage of the first antenna. The satellite communication module is connected with a second antenna 211 and the GPS-controller is connected with a third antenna 212. Further, at least one emergency sensor 207 is connected to the controller module 200 for automatically detecting accidents or malfunctions of the object.

The data bus or network manager 201 is connected to an internal data bus or network 208 of the object in order to retrieve information from and send commands to several vehicle components like motor, brakes, alarm, audio and others. Data messages and phone information is displayed on a display 209.

The cellular phone module 202 provides a phone subscription for private usage or manual requests for assistance (voice- and data-transmission) by a driver or operator of the object, and a service subscription for connection to the customer service center (software program download, voice- and data transmission) and for transmitting and managing several services like remote diagnostics, maintenance, emergency or accident assistance. The service subscription is embedded into the phone module 202. The customer service center 10 as well as the object 20, 24, 25 can request and initiate communication via the service subscription.

The services further comprise e.g. a roadside assistance service, an emergency assistance service, services for transmitting of diagnostic reports like motor status and brake status or malfunction, and/or a service for object location, either periodically or on request of the customer service center or the object. The system further offers the possibility for remote user at the customer service center to retrieve information from or send command to any module in the vehicle connected to the internal data bus or network 208. These reports and information can be stored by the customer service center and used for vehicle maintenance and repair.

The transition from private subscription to service subscription can be initiated by a key press of the operator, if for example a road or emergency assistance is needed. Further, an accident can automatically initiate the service subscription by means of at least one sensor which for example detects an air-bag deployment. Also, service subscription can be activated by an alarm in case of theft. The transition to private subscription is effected by a simple key press ("phone on").

A conflict concerning simultaneous execution of several such services is handled automatically by the system by assigning and affecting a priority to each service. Preferably, an air-bag deployment notification has the highest priority. If for example a driver asks for roadside assistance, the roadside assistance service of the system is activated. If subsequently the driver or a sensor signals an emergency, the roadside assistance service is deactivated and the emergency assistance service is activated. If then an accident occurs, the emergency assistance service is deactivated and an air-bag deployment notification is activated.

The driver can manually request help in any case. If he or she is lost, vehicle position is reported using GPS 40 and GPS controller 204, and navigation information is provided by voice or data communication from the customer service center. If the vehicle has broken down, remote vehicle diagnostic may be performed, vehicle position is reported using GPS and breakdown mechanic and roadside assistance 23 is informed. These are only a few examples of possible manual assistance provided by the inventive system.

In case of emergency detected by the sensor 207, the vehicle status and position are reported automatically to the customer service center or a specific rescue service via the service subscription. A voice communication is also established to enable emergency assistance 21, 22 to contact the driver. The inventive system handles priority between all these functions as disclosed above, so that any on-going phone call or manually requested help function is automatically interrupted to manage the emergency assistance.

The inventive system manages cellular communication via phone module 202 and satellite communication via satellite communication module 203. Satellite is primarily used as a backup when no cellular network is currently available.

The inventive system is modular and can be customized according to the needs.

The controller module 200, the data bus or network manager 201 and the phone module 202 are considered as basic components. User interface manager 205, satellite communication module 203 and GPS controller 204 are considered as optional components.

Fig. 3 shows a block diagram of a second unit of the system as incorporated in a stationary object like a remote facility or plant. It comprises a controller module 200 which is connected to a data bus or network manager 201, a cellular phone module 202 with a first antenna 210 (and a backup antenna as mentioned above) and a satellite communication module 203 with a second antenna 211. The data bus or network manager 201 is connected to an internal data bus or network 208 of the object. Further, at least one emergency sensor 207 is connected to the controller module 200 for automatically detecting accidents or malfunctions of the object. Further, a backup battery (not illustrated) is provided for supplying these modules in case of main battery failure.

Possible applications concern any critical object in remote areas and which is accessible with difficulties. These are for example a water pump in a desert, an electricity generator in the mountains or a navigation beacon on an island.

The object can send an equipment diagnostic report periodically and offer the possibility for a remote user to retrieve information from or send commands to any module of the equipment connected to the internal data bus or network. These reports and information can be stored by the customer service center and used for the equipment maintenance and repair.

In case of a major problem detected by sensor 207, the controller module 200 can automatically report the actual problem and equipment status.

Problem report, equipment status, information and commands are transferred

using cellular or satellite communication data messages. Satellite is used as a backup when no cellular network is currently accessible, again, the cellular phone can handle the above disclosed two subscriptions.

Now, referring to Fig. 4, a flow chart indicating various steps in different operating modes of an object is shown. These modes are a sleep mode S, a standby mode W and a first service execution mode T1.

The sleep mode S ends when a wake up timer has elapsed in step 41. The wake up period is preferably programmable by the customer service center 10. The object enters standby mode W in step 42. It is powered up and initialized. The phone module 202 is activated and the service subscription is selected. The object waits for an incoming data message using cellular communication 30 in step 43 during a defined first period. If no message has been received after this first period according to step 43, satellite communication module 203 is activated in step 44. The object waits for incoming message using satellite communication 31 in step 44 during a defined second period. Preferably, the first and second periods are programmable with respect to time and duration by the customer service center, so that these periods are synchronized with corresponding active periods in the customer service center 10 allowing a connection to reliably be established. If no message has been received after this second period according to step 45, the object returns to sleep mode S via point A where power consumption is minimal.

When a data message has been received according to step 43 or step 45, it is decoded in step 46. Data message preferably has a standard format like for example Global Automotive Protocol for Telematics Standard (GATS). The data message must contain at least one service identifier (code) for selecting the requested service. The selected service is activated in step 47, and the related mode is executed in the object according to step 48. Service execution includes mainly information retrieved from internal data bus or network manager 201, message assembly and message sending

using cellular phone module 202 or satellite communication module 203. It can also include optionally position computation using GPS 40 and voice connection with the customer service center 10. When the first service execution mode T1 is completed, the object returns into standby mode W via point B.

Referring to Fig. 5, a flow chart indicating various steps in further operating modes of an object are shown. These modes are a phone mode P and a second service execution mode T2.

The phone mode (private subscription) ends when the service subscription is activated in step 51. The service subscription can be activated manually by an operator of the object, preferably using buttons, automatically preferably by emergency sensors or by the customer service center 10. Ongoing communication using the cellular phone module 202 in private subscription is interrupted in step 52 and the service subscription is selected in step 53. Preferably a message is displayed on the screen 209 to inform the user that service subscription is now active. The object 20-25 tries to connect to the customer service center 10 (or vice versa) using cellular phone module 202 in step 54. If cellular communication 30 is not possible according to step 55, satellite communication 31 is activated in step 56 by means of satellite communication module 203.

If communication has been established according to step 55 or step 56, the activated service is executed in step 57. Service execution includes mainly information retrieving from the internal data bus or network 208, message assembly and message sending using established cellular phone or satellite communication 30, 31. It can also include optionally position computation using GPS 40 and voice connection with the customer service center 10. When service execution is completed, connection with customer service center 10 is terminated in step 58. The private phone subscription is activated again in step 59 and the second service execution mode T2 is terminated. The object returns to phone mode P via point C. Preferably a message is displayed on the screen 209 to inform the user that the cellular phone module 202 in private subscription

is now active again.

The inventive system has the following advantages:

1.) By using one or more sensors 207 located for example in air-bag units, motor or brakes or elsewhere, emergency situations can automatically be detected and transmitted to the customer service center.

2.) By providing cellular phone and satellite communication, which can also be used simultaneously, a redundant communication link can be established so that reliability of communication is substantially improved.

3.) The controller module 200 can perform remote diagnostics and maintenance via data bus or network manager 201 and internal data bus or network 208, for example vehicle tracking, motor status reporting, fuel level, alarm notification, and commands for door lock and unlock and motor stop, and display related information messages on the screen 209 and/or transmitting to the customer service center 10. These actions can both be initiated by the object (user at the object or automatically by a sensor) and upon request of the customer service center which yields direct access to the internal data bus or network 208 of the object.

4.) By providing a phone subscription for private usage (voice and messages) and a service subscription for emergency and technical assistance the reliability in case of emergency is improved by interrupting and inactivating any private usage.

5.) The controller module 200 can perform priority management between the different services. Emergency assistance preferably has the highest priority.

6.) The modular architecture of the inventive system makes it applicable to both mobile vehicles and static equipment and even small airplanes.

CLAIMS

1. System for communication between at least one central station and at least one remote mobile or stationary object by means of transmitting and receiving means, c h a ra c t e r i z e d in that said at least one object (20, 24, 25) comprises a cellular phone module (202) which provides a private subscription for private usage by a driver or operator of the object (20, 24, 25), and a selectable service subscription for transmitting and managing of at least one service like remote status information, malfunction, diagnostics and maintenance as well as technical and emergency assistance by means of the at least one central station (10).

2. System according to claim 1, c h a ra c t e r i z e d in that the at least one central station (10) is a customer service center and the at least one remote object (20, 24, 25) is a vehicle, a boat, a plane or a remote facility or plant.

3. System according to claim 1 or 2, c h a ra c t e r i z e d in that the service subscription is activated by the central station (10) or the remote object (20, 24, 25).

4. System according to any of the preceding claims, c h a ra c t e r i z e d in that a satellite communication (31) is provided for activation if cellular communication (30) is not availabe.

5. System according to any of the preceding claims, c h a ra c t e r i z e d in that the at least one object comprises a controller module (200) for bidirectional communication with a data bus or network manager (201) which is connected with an internal data bus or network (208) of the object.

6. System according to claim 5, c h a ra c t e r i z e d in that the at least one object comprises at least one of a user interface manager (205), a satellite communication module (203), a GPS controller (204) and at least one emergency sensor (207) for automatically detecting accidents, emergency or malfunctions of the object.

7. System according to any of the preceding claims, c h a ra c t e r i z e d in that a transition from private subscription to service subscription can be initiated by a key

press of the operator and/or automatically by means of at least one sensor (207) for detecting accidents, emergency or malfunctions of the object or by means of a further sensor for detecting an air-bag deployment.

8. Method for communication between at least one central station and at least one remote mobile or stationary object in a system according to any of claims 1 to 7, c h a ra c t e r i z e d in that the at least one object has implemented a sleep mode (S), a standby mode (W) and a first service execution mode (T1), wherein the sleep mode is terminated when a wake up timer elapsed and the standby mode is activated in which the object waits for an incoming message from the service center via a cellular and/or a satellite communication for a predetermined period of time, after which the sleep mode is again activated if no message has been received or a requested service is activated if a related message has been received and decoded.

9. Method according to claim 8, c h a ra c t e r i z e d in that the at least one object has a phone mode (P) and a second execution mode (T2), wherein the phone mode is interrupted when a service is requested, until a cellular and/or a satellite communication between the object and the central station has been established and the service has been executed.

10. Method according to any of claims 8 or 9, c h a ra c t e r i z e d in that a conflict concerning simultaneous execution of several services during service subscription is handled automatically by assigning and affecting a priority to each service and deactivating any services with a minor priority than the service with a first priority.

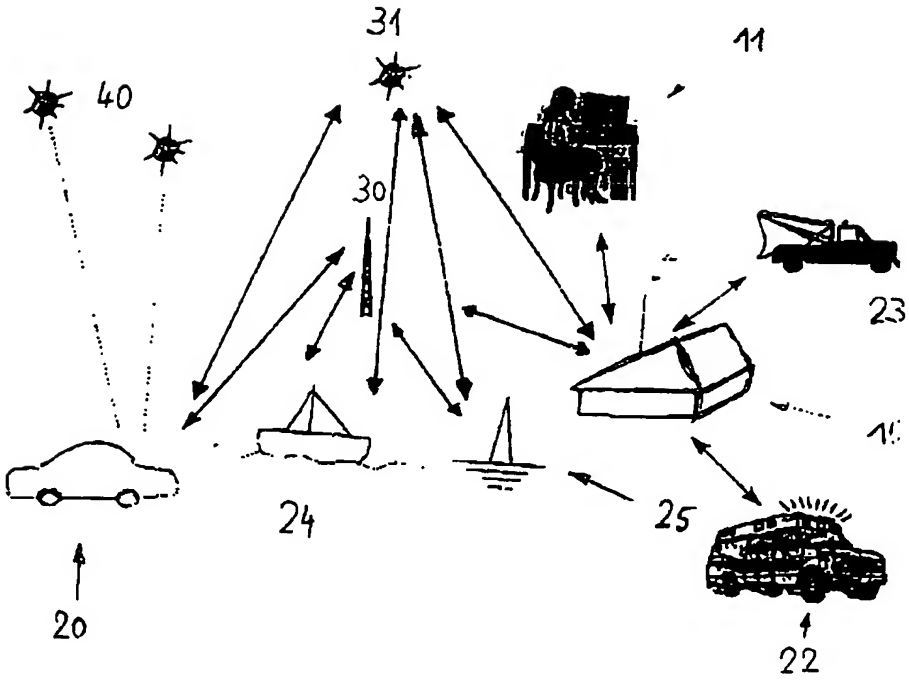

FIG. 1

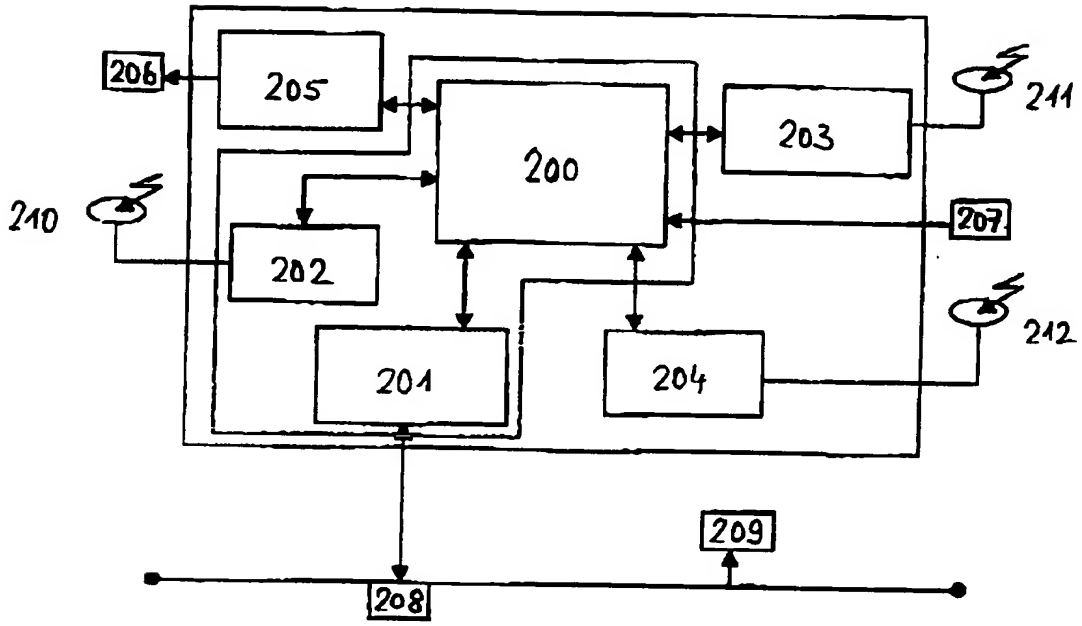
206
205
200
203
211
210
207
202
212
201
204
209
208

FIG. 2

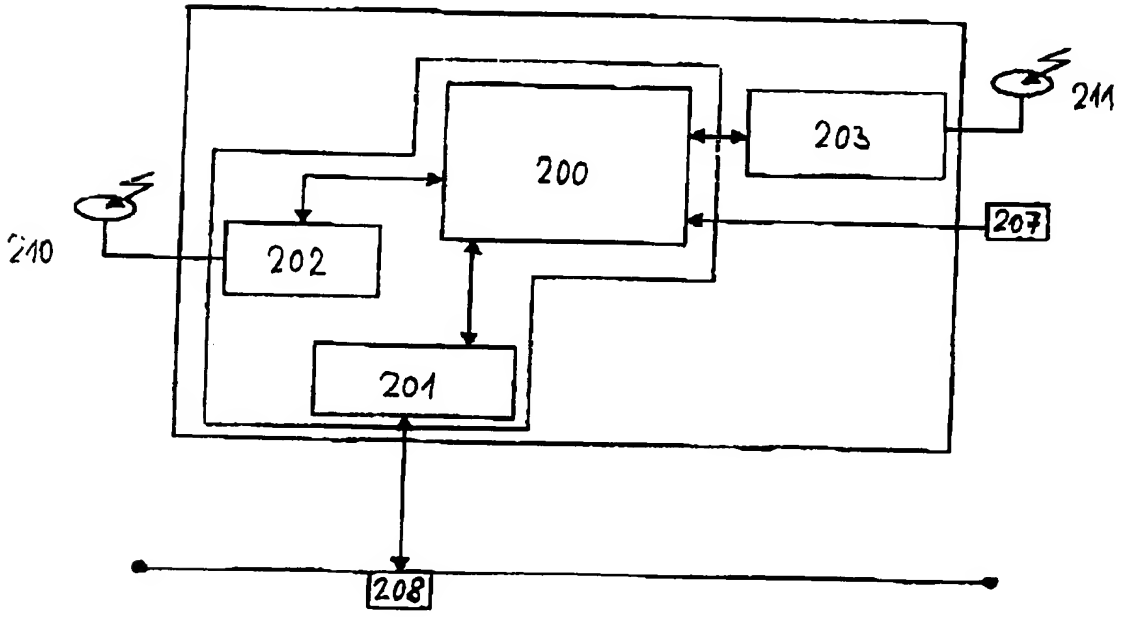
211
203
200
210
207
202
201
208

FIG. 3

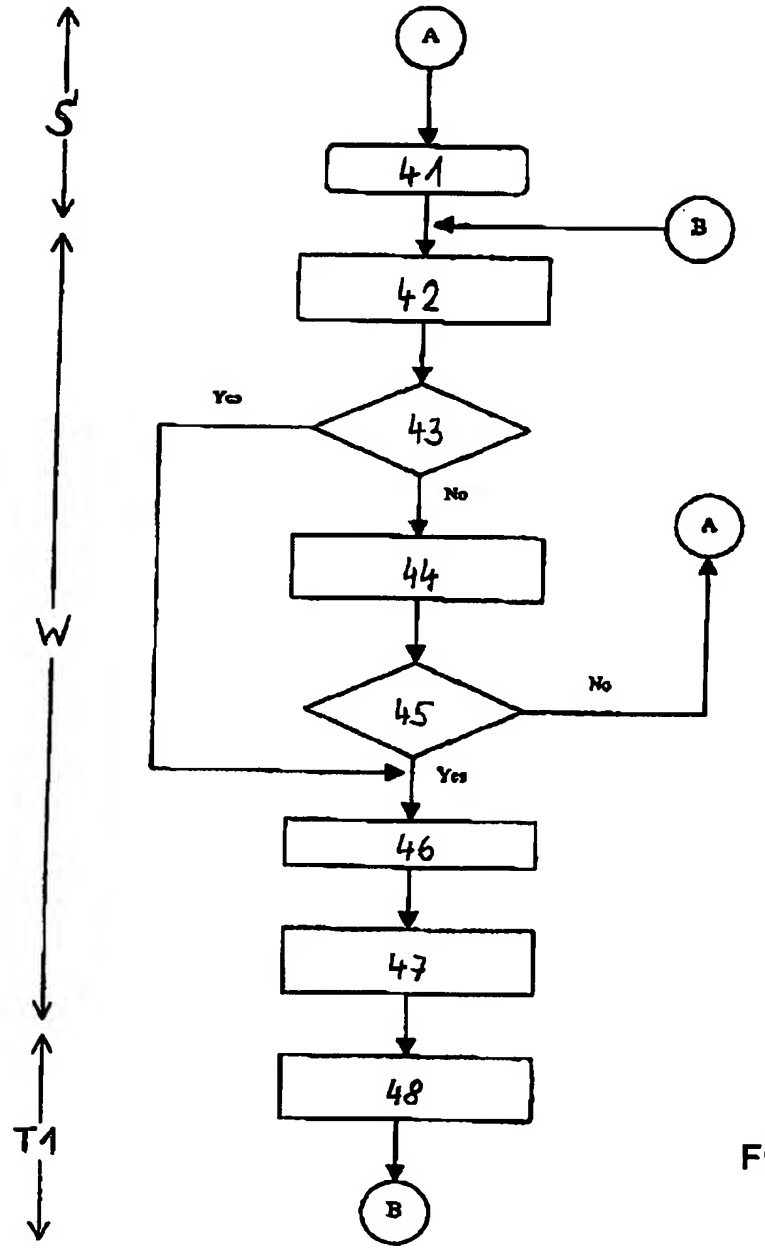

FIG. 4

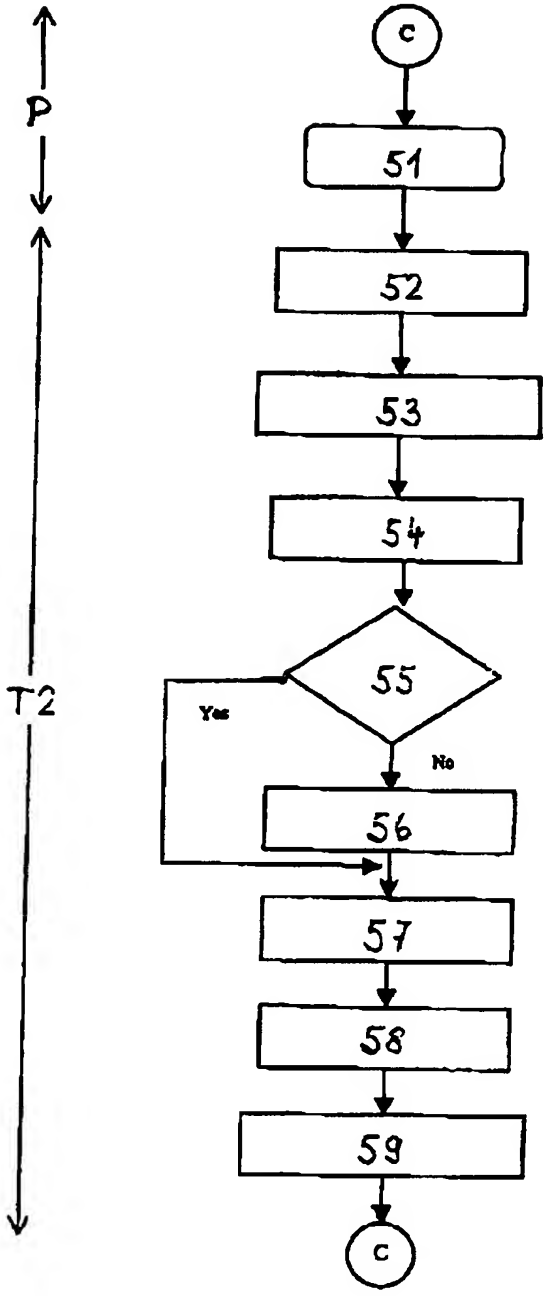

FIG. 5

ABSTRACT

A system for communication between at least one central station (10) and at least one remote mobile or stationary object (20, 24, 25) by means of transmitting and receiving means is disclosed which is characterized in that said at least one object comprises a cellular phone module (202) which provides a private subscription for private usage by a driver or operator of the object (20, 24, 25), and a selectable service subscription for transmitting and managing of at least one service like remote status information, malfunction, diagnostics and maintenance as well as technical and emergency assistance by means of the at least one central station (10).

(Fig. 1)